

REMARKS

Applicant appreciates the consideration of the present application afforded by the Examiner. Claims 19-36 were pending prior to the Office Action. Claims 23, 27, 33, and 36 are amended and claims 19-22, 31, 32, and 35 are canceled through this Reply. Therefore, claims 23-30, 33, 34, and 36 are pending. Claims 23, 27, 33, and 36 are independent.

The Office Action rejects claim 19 under 35 U.S.C. § 102(e) as allegedly anticipated by Yamaguchi (U.S. Pub. No. 2003/0231161); rejects claims 35 and 36 under 35 U.S.C. § 102(b) as allegedly anticipated by Yamamoto et al. (U.S. Pub. No. 2001/0008395); rejects claims 20-22 and 27-30 under 35 U.S.C. § 103(a) as allegedly unpatentable over Yamaguchi in view of Kawashima et al. (U.S. Pat. No. 6,188,380); rejects claim 23 under § 103(a) as allegedly unpatentable over Yamaguchi in view of Yamamoto; rejects claims 24-26 under § 103(a) as allegedly unpatentable over Yamaguchi in view of Yamamoto and further in view of Kawashima; rejects claims 31 and 32 under § 103(a) as allegedly unpatentable over Kawashima in view of Yamaguchi and further in view of Someya (U.S. Pub. No. 2003/0231158); and rejects claims 33 and 34 under § 103(a) as allegedly unpatentable over Kawashima in view of Yamaguchi and Someya and further in view of Yamamoto.

The rejections of claims which have been canceled through this reply are hereby moot. As applied to the remaining claims, Applicant respectfully traverses these rejections. Favorable reconsideration and allowance of the present application are respectfully requested in view of the following remarks.

Interview Summary

Applicant appreciates the time afforded by the Examiner and his supervisor in conducting the Interview on August 31, 2010. During the interview, Applicant's representative asserted that although Yamaguchi and Yamamoto may suggest correcting for a brightness of the backlight based on previously stored information, neither reference teaches or suggests preliminarily storing an association of a luminance measure with an input level of a video signal to be inputted into the liquid control panel and subsequently calculating luminance with respect to each input level and what luminance to set for each gray level of a video signal input. In response, the

Examiner and his supervisor agreed to consider the amendments and arguments in light of these distinctions upon the filing of a formal Reply. No formal agreements were reached.

Rejection under 35 U.S.C. § 103(a)

The Office Action rejects **claim 23** under § 103(a) as allegedly unpatentable over Yamaguchi in view of Yamamoto. Applicant respectfully traverses.

Claim 23 recites a luminance control method for controlling an input level of a video signal to be inputted into the liquid crystal panel to control transmittance of the liquid crystal panel and provide a gray-level display a liquid crystal display device including, *inter alia*,

- performing, at a time before actually displaying an image, the steps of:
 - measuring a luminance of light emitted through the liquid crystal panel in each input level, and preliminarily storing the measured luminance associated with an input level which gives the luminance; and
 - subsequently performing, at a time of actually displaying the image, the steps of:
 - setting a desired luminance set value of light emitted through the liquid crystal panel in a state where the liquid crystal panel has a predetermined transmittance;
 - calculating a luminance of light emitted through the liquid crystal panel in each input level and a luminance to be set in each gray level in a case of the luminance set value, on the basis of the stored luminance and input level;
 - extracting an input level, which gives a luminance substantially equal to the luminance to be set in each gray level, on the basis of the luminance in each calculated input level and the luminance to be set in each gray level, and storing the extracted input level associated with a gray level; and
 - controlling the transmittance of the liquid crystal panel in a gray level associated with the input level of the video signal.

The Examiner correctly recognizes that Yamaguchi does not disclose the features of previous claim 23 (see pages 13-14 of the Office Action). In support of this rejection, it is asserted that paragraphs [0039]-[0041] of Yamamoto cure this deficiency of Yamaguchi. Applicant respectfully disagrees.

Applicant submits that this citation of Yamamoto, and indeed the reference as a whole, fails to teach or suggest preliminarily storing, at a time before displaying an image, an association of a luminance measure with an input level of a video signal to be inputted into the liquid control panel and subsequently, at a time of actually displaying an image, calculating

luminance with respect to each input level and what luminance to set for each gray level of a video signal input. There is simply no description in the paragraphs [0039]-[0041] of Yamamoto concerning the input level of a video signal or the gray level.

Instead, Yamamoto only discusses the “brightness” and describes that the optical sensor measures how the liquid crystal panel is emitting light for the purpose of brightness control of the backlight. In contrast, the input level of the video signal and the gray level of the claimed invention indicate data quantities for driving the liquid crystal panel and are related to gray-level display. In the absence of any disclosure regarding the input level or gray level, Applicant fails to appreciate how the Yamamoto reference can teach associating measures of luminance with the data quantity for an input level of the video signal that will control the transmittance of the liquid crystal panel to achieve an optimum gray-level display.

Furthermore, Yamamoto clearly teaches that the backlight is controlled on the basis of the brightness of the image currently displayed (see paragraph [0038]). According to aspects of the present invention, at the time that the user uses the liquid crystal display to display an image the maximum luminance may be calculated and the gray level characteristic can be amended in accordance with the maximum luminance, based on a luminance set value and an association between measured luminance of light and each input level of the video signal preliminarily stored at a time *before* actually displaying an image. Applicant respectfully submits that none of the applied prior art references achieve these features of the claimed invention, alone or in combination.

For a rejection under 35 U.S.C. § 103 to be proper, a *prima facie* case of obviousness must be established (*see, e.g.*, MPEP § 2142). One requirement to establish *prima facie* case of obviousness is that the prior art references, when combined, must teach or suggest all claim limitations (*see, e.g.*, MPEP § 706.02(j); MPEP § 2142). Thus, if the cited references fail to teach or suggest one or more elements, then the rejection is improper and must be withdrawn.

Based on the foregoing, as neither Yamaguchi nor Yamamoto, either alone or in combination, teach or suggest at least the above features of the claimed invention (assuming these references are combinable, which Applicants do not admit), Applicants respectfully submit that claim 23, and likewise the claims dependent thereon, is patentable over the references as cited. It is respectfully requested that the outstanding rejection be withdrawn.

The Office Action rejects **claim 27** under § 103(a) as allegedly unpatentable over Yamaguchi in view of Kawashima. Applicant respectfully traverses.

Claim 27 recites a luminance control method for controlling an input level of a video signal to be inputted into the liquid crystal panel to control transmittance of the liquid crystal panel and provide a gray-level display for a liquid crystal display device including, *inter alia*,

- measuring a luminance of light emitted through the liquid crystal panel in each input level;

- normalizing each measured luminance, and preliminarily storing each normalized luminance associated with an input level which gives the luminance;

- calculating a luminance of light emitted through the liquid crystal panel in each input level and a luminance to be set in each gray level in a case of the luminance set value, on the basis of the stored luminance and input level;

- extracting an input level, which gives a luminance substantially equal to a luminance to be set in each gray level, on the basis of the luminance in each calculated input level and the luminance to be set in each gray level, and storing the extracted input level associated with a gray level; and

- controlling the transmittance of the liquid crystal panel in a gray level associated with the input level of the video signal.

The Examiner correctly recognizes that Yamaguchi does not disclose the features of claim 27 (see pages 11-12 of the Office Action). In support of the rejection, it is asserted that columns 39-41 of Kawashima cure this deficiency of Yamaguchi. These columns of Kawashima fail to exist, however. Applicant notes that the Office Action appears to recite the same column and line numbers referring to Kawashima as the paragraph and line numbers with respect to Yamamoto in the rejection of claim 23 on pages 13-14 of the Office Action. Further, after review of the entire reference Applicant still fails to appreciate how the Kawashima reference can teach associating measures of luminance with the data quantity for an input level of the video signal that will control the transmittance of the liquid crystal panel to achieve an optimum gray-level display. No such disclosure is present in Kawashima.

Based on the foregoing, as neither Yamaguchi nor Kawashima, either alone or in combination, teach or suggest at least the above features regarding the input level and gray level, Applicants respectfully submit that claim 27, and likewise the claims dependent thereon, is patentable over the references as cited. It is respectfully requested that the outstanding rejection under § 103 be withdrawn.

The Office Action rejects **claim 33** under § 103(a) as allegedly unpatentable over Kawashima in view of Yamaguchi, Someya, and Yamamoto. Applicant respectfully traverses.

Claim 33 recites a liquid crystal display device for controlling an input level of a video signal to be inputted to the liquid crystal panel to control transmittance of the liquid crystal panel and provide a gray-level display comprising, *inter alia*, the features of

- the first storage unit further stores second information on a luminance of light emitted through the liquid crystal panel in each input level, and

- the liquid crystal device further comprises:

- a second calculating unit for calculating a luminance of light emitted through the liquid crystal panel in each input level in a case of the luminance set value accepted by the accepting unit, on the basis of the second information;

- a third calculating unit for calculating a luminance to be set in each gray level in a case of the luminance set value accepted by the accepting unit;

- a fourth calculating unit for calculating a luminance difference between the luminance to be set in each gray level calculated by the third calculating unit and the luminance in each input level calculated by the second calculating unit;

- a second storage unit for storing an input level, which gives a minimum luminance difference calculated by the fourth calculating unit, associated with a gray level; and

- a control unit for controlling the transmittance of the liquid crystal panel in a gray level associated with the input level of the video signal.

The Examiner correctly recognizes that Kawashima, Yamaguchi, and Someya fail to disclose the features of claim 33 (see Office Action, page 22). In support of the rejection, the Office Action asserts that paragraphs [0039]-[0041] of Yamamoto allegedly cure this deficiency.

However, as discussed above with respect to independent claim 23, there is simply no description in paragraphs [0039]-[0041] of Yamamoto concerning the input level of a video signal or the gray level. Instead, Yamamoto only discusses the “brightness” and describes that the optical sensor measures how the liquid crystal panel is emitting light for the purpose of brightness control of the backlight. In contrast, the input level of the video signal and the gray level of the claimed invention indicate data quantities for driving the liquid crystal panel and are related to gray-level display. In the absence of any disclosure regarding the input level or gray level, Applicant fails to appreciate how the Yamamoto reference can teach associating measures of luminance with the data quantity for an input level of the video signal that will control the transmittance of the liquid crystal panel to achieve an optimum gray-level display.

Based on the foregoing, as none of Kawashima, Yamaguchi, Somaya, or Yamamoto, either alone or in combination, teach or suggest at least the above features of the claimed invention regarding the input level and gray level, Applicants respectfully submit that claim 33, and likewise the claims dependent thereon, is patentable over the references as cited. It is respectfully requested that the outstanding rejection under § 103 be withdrawn.

Rejections under 35 U.S.C. § 102(b)

The Office Action rejects claim 36 under § 102(b) as allegedly anticipated by Yamamoto. Applicant respectfully traverses.

Claim 36 recites a recording medium on which a computer program is recorded for causing a computer to output control information to control an input level of a video signal to be inputted into the liquid crystal panel to control transmittance of the liquid crystal panel and provide a gray-level display, comprising *inter alia*, features comparable to the input level and gray level features discussed above with respect to claim 33. In support of the rejection, page 8 of the Office Action asserts that paragraphs [0039]-[0041] of Yamamoto allegedly anticipate these features.

However, as discussed above with respect to claim 33, Applicant respectfully submits there is simply no description in Yamamoto concerning the input level of a video signal or the gray level. Instead, Yamamoto only discusses the “brightness” and describes that the optical sensor measures how the liquid crystal panel is emitting light for the purpose of brightness control of the backlight. In contrast, the input level of the video signal and the gray level of the claimed invention indicate data quantities for driving the liquid crystal panel and are related to gray-level display. In the absence of any disclosure regarding the input level or gray level, Applicant fails to appreciate how the Yamamoto reference can teach associating measures of luminance with the data quantity for an input level of the video signal that will control the transmittance of the liquid crystal panel to achieve an optimum gray-level display.

In order to establish a *prima facie* case of anticipation under 35 U.S.C. § 102, the cited reference must teach or suggest each and every element in the claims (*see, e.g.*, MPEP § 706.02; MPEP § 2131). Accordingly, if the cited reference fails to teach or suggest one or more claimed elements, the rejection is improper and must be withdrawn.

Based on the foregoing, as Yamamoto fails to anticipate at least the above features of the claimed invention regarding the input level and gray level, Applicants respectfully submit that claim 36 is patentable over Yamamoto. It is respectfully requested that the outstanding rejection under § 102(b) be withdrawn.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Notice of same is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact John R. Sanders (Reg. No. 60,166) at the telephone number of the undersigned below to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By Charles Gorenstein
Charles Gorenstein

Registration No.: 29271

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road, Suite 100 East

P.O. Box 747

Falls Church, VA 22040-0747

703-205-8000